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SCIENCE NEWS LETTER

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THE WEEKLY SUMMARY OF CURRENT SCIENCE

Rotors Aloft

See Page 338

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AERONAUTICS

Faster Than Sound Flight

Use of new wind tunnels is helping to penetrate the mystery of transonic speed range, which is about 600 to 1,000 miles per hour.

See Front Cover

► THE greatest unknown region of aviation, the speed range from about 600 to 1,000 miles per hour, is being conquered. The fear and mystery of the "stone wall" of the transonic range is being overcome through use of new wind tunnels at the Langley Aeronautical Laboratory of the National Advisory Committee for Aeronautics.

For two years there has been no question but that man could fly faster than sound. The X-1 did it for a few minutes and probably several other experimental planes have done so since and will go on doing it. (Just how fast and when and where and how are still kept secret).

But more is necessary. Thorough exploration of the speeds close to sound's speed must be done in artificial superhurricanes—wind tunnels.

During the series of inspections of the great NACA research plant at Langley Field, Va., now underway, a new transonic wind tunnel was disclosed. Actually it has been in operation for several years, piling up information that has been kept secret in the interests of devising planes that can fly through the sound speed barrier and beyond.

This new tunnel gets its speeds by whirling a model on the rim of a disk about five feet in diameter. Its speed range is from Mach 0.80 to Mach 1.3, as the scientists express it. This corresponds to 600 to 1,000 miles per hour, since Mach 1.0 is the speed of sound, which at sea level is approximately 760 miles per hour. This range of the NACA transonic wind tunnel has been considered the blind spot in tunnel techniques.

There are several other tunnels at the Langley Laboratories that have speeds well above the speed of sound. These supersonic tunnels, as well as the subsonic tunnels, so useful in designing conventional aircraft of the past, get a choking effect and fail to give reliable results through range of the speed of sound.

Information about what happens at about the speed of sound is obtained by flight tests of several sorts. Models heavily weighted have been dropped from airplanes high in the air, and while plunging down to earth what happens to them is radioed back by instruments carried. Rockets launched from the ground carry models into the ordinary atmosphere to give other transonic tests. Little models are mounted in such a way on test airplanes, diving at

530 miles per hour, that a supersonic wind created over part of the upper surface of the wing does the testing.

The fastest of the NACA wind tunnels is the four-by-four-foot supersonic tunnel at Langley, although there are somewhat larger supersonic tunnels at both Ames Laboratory in California and the Lewis Propulsion Laboratory at Cleveland. Speeds up to Mach 2.2 (1670 miles per hour) are obtained in the four-by-four-foot tunnel. Viewing apparatus allows observers to see the shock wave envelop the model as the speed is increased, and finally the shock wave can be seen actually to detach itself from the forward edge of the supersonic wing so that the shock gets there before the arrival of the airplane part that causes it.

These complex tunnels and instruments

are the stuff that will allow the design of the supersonic airplanes of the future.

At present there are no supersonic airplanes ready to fight or do useful work. We don't know enough to carry a tactical airplane through the speed of sound and beyond and have it operate the way pilots expect good airplanes to do. There are not yet practical man-carrying fighters at above the speed of sound.

But there is no longer fear of the speed of sound. Aviation is well on its way through the transonic range and beyond.

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On This Week's Cover

► TO improve the design of helicopters, the air flow around the whirling blades, called rotors, are studied at the Langley Aeronautical Laboratory of the National Advisory Committee for Aeronautics. The cover photograph shows the flow pattern of the air when the blades start whirling and there is rapid increase of thrust. The way the air travels is shown by balsa dust whirled around by the model.

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MEDICINE

Check Enlargement III

► ACROMEGALY, the disease in which there is progressive enlargement of the head, feet and hands, apparently can be controlled with sex hormones if detected in the early stages.

Furthermore, a reliable test for detecting it early has been developed, and a second test is being perfected. The second test involves the first assay of the growth hormone in human blood.

This has been reported by a group of University of California Medical School scientists working under a contract with the Office of Naval Research. The scientists include Drs. Laurence W. Kinsell, George D. Michaels, C. H. Li, and William E. Larsen, Lt. (jg) M. C., USN.

In a follow-up of work suggested several years ago at Harvard University, the scientists have succeeded in halting the progress of the disease for a period of two years in two male patients. Androgens, male hormones, and estrogens, female hormones, were administered to the patients.

The successes are based on a theory posed by the group to account for the differences in growth in childhood and adolescence.

Dr. Kinsell said that apparently the growth hormone of the pituitary, tiny gland at the base of the brain, is solely responsible for growth during childhood. At puberty the sex hormones are manufactured, suppress the activity of the growth hormone, and substitute a new type of growth stimulation which brings about maturity.

In some cases, when the sex hormones fail to suppress the growth hormone, the individual continues to grow to abnormally large size. This is known as acromegalic gigantism.

In other instances there is a sudden renewal of growth after maturity, and this is true acromegaly. Dr. Kinsell says this is usually caused by a tumor of the pituitary, resulting in such over-production of the growth hormone that the sex hormones cannot suppress its action.

Evidence to support this concept was found, and resulted in the development of the group's diagnostic test. They found that whenever there is fast growth—in childhood, in gigantism or in true acromegaly—there is a consistently high phosphorus content in the blood.

To back this up, Dr. Li found there is an increase in the amount of growth hormone in the blood under the same conditions, though this test is still in the early stages.

The phosphorus test can now be used to detect acromegaly and to determine how effective treatment is.

Treatment of the two patients, aged 20 and 28, with testosterone propionate and ethinyl estradiol, brought about a cessation in severe headaches, abnormal growth, a decrease of phosphorus in the blood, and an apparent decrease in the size of pituitary tumors. There has been no apparent growth since treatment was started.

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MEDICINE

Cancer Cell Chemical

Laboratory tests with rats and mice have shown that a chemical extract from cancer cells produces a thyroid disturbance.

► THE discovery that cancer throws the thyroid glands of animals into a tailspin has put scientists on the trail of a chemical substance which may be the cause of growth of some tumors.

This is reported by a group of University of California scientists supported by the American Cancer Society and the Christine Breon Fund. It apparently is the first discovery of the disturbance by cancer of a generalized metabolic function.

The researchers found that in cancerous rats and mice there is a general decrease in the thyroid's ability to accumulate iodine. Coupled with this is a two-fold increase in the depositing in the skin of thyroglobulin, as compared with normal animals. Thyroglobulin is a chemical parent of the thyroid hormone.

After finding this effect with several types of tumor, the scientists crushed tumor cells of the same types, and injected the resulting homogenates into animals. Though these animals had no growing tumors, the chemical extract of the cancer cells caused the same thyroid disturbances. The conclusion is that a chemical in the cancer cells is responsible for the disturbances.

The scientists hope their studies with radioactive thyroglobulin may reveal the nature of this chemical substance. Subsequently it may be possible to neutralize

the substance and control the rate of tumor growth in man, to develop a diagnostic test for cancer, and to gain greater insight into the relationship of the cancer and its host.

The research was done by Drs. Kenneth G. Scott, Warren Bostick, Michael Shimkin, and Joseph G. Hamilton.

The scientists also reported two new methods of synthesizing thyroxine and its precursors, or chemical parents, monoiodo and diiodo tyrosine, which will make these substances less expensive and more easily obtainable.

One method is to allow rats to synthesize thyroxine. After the rats have synthesized the hormone following injection of radioactive iodine, the animals are sacrificed and the hormone extracted.

The other technique involves paper chromatography. Thyroxine and its precursors are readily synthesized in the laboratory but are difficult to separate from impurities by ordinary chemical means.

When the substances are allowed to flow down a vertically placed filter paper, the substances stop at different points. The substances are neatly separated, and, because only minute amounts are needed, sufficient can be recovered from the paper for experimental purposes.

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ENGINEERING

Modern Telephony Carrier

► THE coaxial cable system, used in sending hundreds of telephone conversations over the line at the same time, is now 20 years old, and its invention received proper notice at the Bell Telephone Laboratories at which the two inventors were present.

The first installation of coaxial cable was at Phoenixville, Pa., late in 1929. There are many thousands of miles of it now in use, and by the end of 1950 approximately 12,000 miles are expected to be installed. This will provide heavy-capacity communication facilities between virtually all the large cities of the East, Midwest and Pacific Coast.

Credit for the invention of the coaxial cable is given by the Bell organization to two of its engineers, Lloyd Espenschied and Herman A. Affel, both of the Bell Laboratories. There has been much improvement since the first type was developed. Today's cable can carry 600 simultaneous telephone conversations, or two television

programs, on each pair of the eight tubes included in it. This capacity may some day be doubled, it is expected.

The name coaxial comes from the fact that a copper pipe used as a tube, and a copper wire centered within it, have the same axis. The wire is held in exact position by insulating disks about an inch apart. The tubes are used in pairs, each transmitting in one direction. The tubes confine the electric waves that travel through them with almost the speed of light, and carry them to their destination without the spreading in all directions that takes place in radio broadcasting.

A coaxial tube can carry an extremely wide band of wave frequencies simultaneously, wider in fact than the entire spread of frequencies used by all radio stations in ordinary broadcasting. In order to obtain many different voice pathways for separate conversations within a tube, the frequency band is divided up into separate

channels. Crystal filters select the individual voice channels at the cable ends in a manner similar to that by which a radio is tuned in a single station.

The coaxial cable, in its lead sheath, is usually placed underground where it is generally safe from breakage from storms and other causes. It is filled with inert nitrogen as another safety measure. Where lightning storms are frequent, the lead cable is protected by a copper coating.

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BIOLOGY

Boys Are Increasing in Upper-Class Families

► THE proportion of boys born in upper-class families has increased during the last 30 years, so that today the well-to-do papas welcome 125 boy babies into the world for every 100 girls.

This was revealed when Dr. Marianne E. Bernstein, of Purdue University, made a study of 3,898 families of the United States and Germany.

Dr. Bernstein, in HUMAN BIOLOGY (Sept. 1948) attributes the proportional increase in the births of boys to improvement in living conditions in the last 30 years. She also believes that birth control may have an indirect effect by cutting down miscarriage.

The increase occurs in both small and large families.

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COAXIAL CABLES—The old and the new in coaxial cables is shown by the Bell Laboratories inventors, Lloyd Espenschied (left) with a section of the cable in the first installation and Herman A. Affel showing the cable of today.

MEDICINE

New Germ-Fighting Drug

► A NEW disease-fighting drug was announced by Dr. Walter J. Nungester and Ada M. Ames of the University of Michigan at the meeting of the Society of American Bacteriologists in Cincinnati.

The drug is one of the man-made chemicals called quaternary ammonium compounds. Some of its relatives are used to make soapless soaps, or detergents. It acts by stimulating the body's natural defenses against germs, increasing the action of the phagocytic white blood cells which normally engulf invading bacteria. This is different from the action of penicillin and sulfa drugs which destroy or check the germs themselves.

One of these compounds gave complete protection to 16 out of 20 mice receiving

100,000 times the killing dose of Type I pneumonia germs. Another quaternary ammonium compound gave protection to 19 out of 20 mice threatened by the same dose of pneumonia germs. All untreated animals given this dose died within 24 hours.

These compounds have not yet been tried on humans and further study must be made before their usefulness for humans can be determined. But if they live up to present expectations, they may in future be useful in a two-way attack on disease. For this they might be given with a sulfa drug, penicillin or some other medicine that destroys germs while the new anti-germ chemical is stimulating the body's own defenses.

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GENERAL SCIENCE

Canners Omit Food Cans

► THERE is not even one canned calorie in the corner-stone of the new building of the National Canners Association, now being erected a few blocks from the White House.

Copies of research reports, daily newspapers, even tempting canned food recipes, and labels from commercial canned food are sealed in the stone for posterity to discover when buildings of mid-twentieth century become old and retired.

But the canners' capsule has not one tin of food, or can of beer, bottle of sauce or jar of edible material, just two cans, sealed, of papers and a glass jar of records, all non-nutritious. These historical items were presumably chosen in hope they would not become stale or spoiled.

Yet what is more ancient than yesterday's newspaper?

Cans of food are intended to be opened and eaten in a year or two, and most of them are. They will last for years—almost forever—if the cans do not corrode and the contents keep sterile. The record for canned food longevity is about 50 years.

Wisconsin corn canned 50 years ago is one of the prized possessions of Continental Can Company, and some of these specimens opened recently were in good condition. The first food canned in America was lobster, it is said. That was 1819, and no specimens remain. Not long ago, however, some of the canned food that Admiral Peary took with him on one of his early trips to the Arctic was brought back to civilization, and it was in good condition.

The scientists who work in the present laboratories of the National Canners As-

sociation and who will move in about a year to the new building are constantly working out new methods of food preservation and taking care of the continual problems that arise in the industry. Like so many other things, canning had its beginning from a Napoleonic need. The Little Corporal offered a prize for a method of serving food for his armies, and Nicholas Appert, a Frenchman, won the prize when he invented canning. His new art was first applied to meat and soup.

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PSYCHIATRY

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PSYCHIATRY

Dream World of Students

Fantasies of boys and girls are filled with aggression and violence, it was found when they were shown a series of pictures and asked to make up a story.

► WHEN high school boys and girls give free rein to their imaginations, they dream up a world filled with aggression—death, murder, fighting and crime.

The extent to which the adolescent's dream world is a hostile place was brought to light when psychologists under the direction of Dr. Percival M. Symonds, of Teachers College, Columbia University, showed a series of pictures to 20 boys and 20 girls aged from 12 to 18 and asked them to make up a story on each picture. After the stories were told, each author was asked where the story originated. Source of more than 40% was in personal experience of himself or others. For only 44 stories were the comics mentioned as a source.

The stories of many boys, particularly the younger ones, were very exciting. One boy became so aroused by his own stories that he had to leave his chair and pace up and down the room while telling them. There were real adventure stories, Dr. Symonds reports in a new book, *ADOLESCENT FANTASY* (Columbia), giving details of the study. They had deep-dyed plots, dramatic incidents, hair-raising escapades, cold-blooded deeds, and fast action.

Boys produced stories of violent death, crime and murder, more often than did the girls. But boys also told more stories of love and falling in love than did the girls. The boys were found to be more interested in wealth and riches than are girls.

Girls also fill their stories with aggression, but it is more often expressed as disobedience, rebellion and scolding or forbidding.

Punishment followed crime in these stories with almost monotonous regularity and the punishment was likely to be extreme—execution. The policeman is a familiar character in the tales by these high school and junior high school authors.

Second only to crime as a theme for adolescent imaginings, is love, but in only a few cases did the love stories deal with sex. There were stories of dating, friendship, family affection, and "Married and lived happily ever after."

Success stories were popular, but usually unrealistic. Like the Horatio Alger stories, they dealt usually with success in making one's way in the world—seldom with success in school or a college career. Money came easily and in astronomic quantities.

School is revealed by these stories as a far from happy place. It is shown to be a place filled with anxiety. Punishment and the threat of failure was always present.

Teachers were almost always stern, threatening and avenging figures. Homework was a burden.

Concern over popularity and personal appearance was shown to be a worry, particularly with the girls.

Dr. Symonds warns against using stories such as these to divine anything about the life history of the boy or girl telling them. In general, when a theme is exaggerated in the stories there is an absence of this trend in the personality of the individual, and vice versa, he found. Individuals with stories filled with violence and hostile aggression turned out to be in real-life sissies,

ingratiating, inhibited and docile. Those who tell bizarre, fantastic stories containing elements of mystery turn out to be quiet, lazy, indifferent and without initiative or queer, nervous and immature.

The story-teller was found to put himself into the tale he told. But again caution is urged in interpretation. For the boy or girl author may appear in the role of any, or all, the characters in his creation. And it is not in the least difficult for him to identify himself with a character of the opposite sex or a different age level. In fact stories contain various displacements and disguises to hide the identity of the actual persons toward whom the feelings expressed in the story are directed in real life.

The psychologist can learn much about personality from the study of such stories, Dr. Symonds concludes, but he must proceed by indirection and must learn all he can about the individual before attempting to interpret his fantasies.

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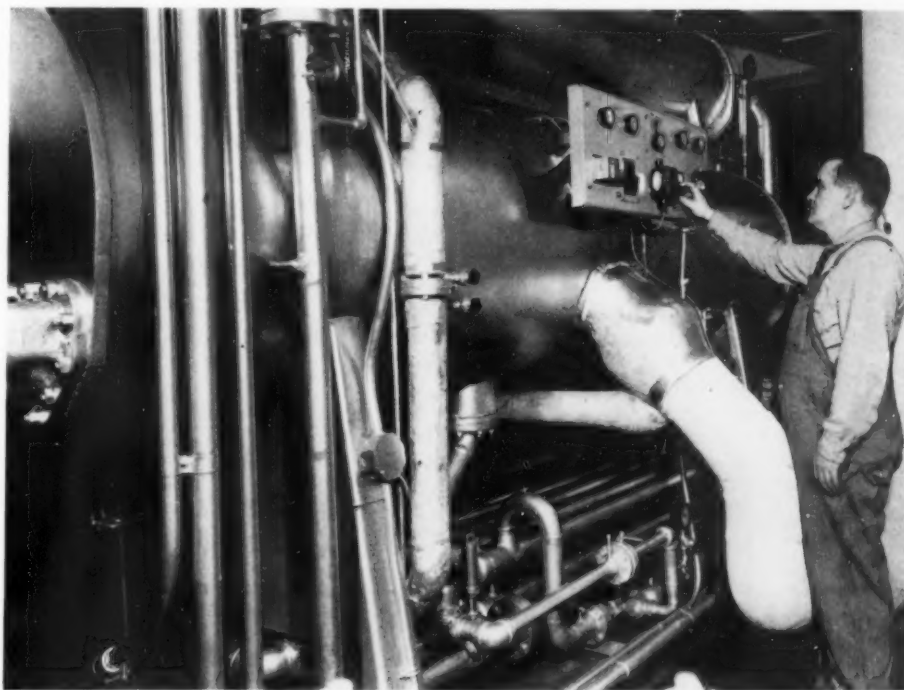
ENGINEERING

Boilers Become Coolers

► BOILERS that furnish steam for winter heating are now furnishing steam for summer cooling, the Carrier Corporation of Syracuse, N. Y., has revealed. It is used in a new cooling unit in which plain water is employed as a refrigerant and a simple salt as an absorbent.

One particular advantage of this air-

conditioning system is that it provides a balance in steam loads for summer cooling and winter heating. It represents a significant advance in areas where steam can be produced at relatively low cost, where there are district steam plants, where natural gas is available, or where a factory or department store or office building has



NEW COOLING UNIT—This new absorption machine uses steam to produce cooling. It generates cool air equivalent to the melting of 300,000 pounds of ice every 24 hours.

a steam plant that is relatively idle in summer, a Carrier official states.

This new absorption machine, thoroughly tested during the past few years, will operate on either high or low pressure steam. Aside from a small solution pump it has no moving parts, and is therefore practically noiseless and vibrationless. It is lighter in weight and more compact than other heavy duty refrigerating equipment.

The Carrier machine consists of two shells, a heat exchanger, a solution pump and auxiliaries. Water to be chilled is sprayed into one shell, the absorber-cooler shell or flash evaporator. Since this shell is maintained at a high vacuum, a portion of the chilled water evaporates and cools the rest. The chilled water drains from the cooler tank, and is pumped to the load. The temperature of the chilled water leav-

ing the machine depends on the concentration and temperature of the salt solution sprayed over the coil located in the lower part of the shell, which forms the absorber unit.

The part played by the steam is in the re-concentration of the salt solution due to the absorption of water in the process. The steam, admitted to the tubes carrying the solution, heats it and drives off the water vapor previously absorbed in the absorber section, thus restoring the original concentration.

No claims are made by the corporation that the absorption principle used is new. The claims have to do with the refrigerant-absorbent combination employed, and its safety over such types of plants as use ammonia or other toxic chemicals.

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BACTERIOLOGY

Sickness Diagnosis Tool

► A NEW tool for diagnosing sickness due to germs, especially the virus kind of germs, was announced by Dr. Irwin S. Neiman of the Chicago Medical School at the meeting in Cincinnati of the Society of American Bacteriologists.

The diagnostic tool would be an anti-antibody. An antibody is a disease-fighting substance formed in the body in response to invasion of disease germs. Antibodies are specific for the antigens of the particular germs that call them up. Antitoxin, the material Dr. Neiman worked with, is the specific antibody for the toxin of the diphtheria germ.

Antitoxin combines with the diphtheria toxin, but will also, he discovered, combine with a powerful anti-antitoxin, or anti-antibody. The anti-antibody is not needed to diagnose diphtheria, but in some diseases, especially some virus diseases, it would help. These are ones in which the virus antigen is not easily available for testing to find whether the patient's blood contains antibodies to it. But an anti-antibody might be prepared and used instead. The reaction showing the presence of the antibody in the patient's blood would show that the germ calling up the antibody was also present, and thus clinch the diagnosis.

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PHYSICS

Soviets Claim Meson Find

► SIXTEEN kinds of subatomic particles born of cosmic rays high in the upper atmosphere of the earth are claimed as discoveries during the past three years by two Soviet scientists, who make their bid for recognition in a letter, dated last Sept. 23, to the British journal, *NATURE* (May 14). It was received in London in February.

Western world physicists have recognized solidly two kinds of fleeting particles that they call mesons, with weights 216 and 286 times that of the electron. These are created by cosmic rays from outer space and they have also been created artificially in the largest of the Berkeley, Calif., cyclotrons. They live but a brief fraction of a second.

But the Russian scientists, A. I. Alichanov and A. I. Alichanov by name, report the detection of mesons with the following masses: 110, 140, 200, 250, 300, 350, 450, 550, 680, 850, 1,000, 1,300, 2,500, 3,800, 8,000, and approximately 25,000. They would prefer to call these particles "vary-

tons" to emphasize the diversity of masses of the new particles. They published their first results in Russian in December, 1946, and a month later in English, but they feel that for these and subsequent discoveries western physicists have not given them credit.

Dr. C. F. Powell of the University of Bristol, who is one of the British scientists charged with ignoring the Russian claims, explained that information had reached him by word of mouth in May of last year and that he had referred to the Russian work in papers since then.

Prof. Alichanov was invited to the Bristol symposium on cosmic rays last September, but he could not attend. Dr. Powell blames failure to comment earlier on the Russian work upon "difficulties of communication and intercourse between us which exist at the present time."

Apart from the Russian work, Dr. Powell said, the only evidence for the existence of other types of mesons than the 216 and

286 weights consists of individual photographs, no two of which represent the same process. The existence of many types of mesons, sufficiently stable to be observed, is of great importance in Dr. Powell's opinion. He suggests further experiments to reduce statistical variations of the Russian observations and give a decisive answer as to whether the many kinds of new particles exist.

Scientists expect experiments with mesons to throw much light on the nature of the nucleus of the atom which is involved in the release of atomic energy. For this reason, there is a keen scientific race to obtain the most information possible at the earliest time.

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PHYSICS

Predict New Stable Kinds Of Chemical Elements

► THREE NEW, stable varieties of chemical elements are predicted by Dr. Henry E. Duckworth, Wesleyan University chemist at Middletown, Conn., and one of them, a very rare sort of platinum, has already been detected, according to a report in *PHYSICAL REVIEW* (May 1).

Radioactive isotopes, which are unstable varieties of the elements, have been discovered by the dozen in recent years as a result of atom-smashing and atomic energy research. But discovery of permanent elements is rather unusual.

The rare, stable isotopes deduced from the relationships between those known to exist are: tellurium 118, gadolinium 150 and platinum 190. These supposed new ones are all lighter than the most plentiful stable isotopes of these elements.

Platinum 190 was actually discovered by Dr. Duckworth, working with Robert F. Black and Richard F. Woodcock, as a line in a mass spectrum photograph made with a spark between ordinary platinum electrodes. The newly detected sort of platinum is present one part in about 16,000 parts of commercial platinum.

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WILDLIFE

Closed Season Decreed on Alaska Mountain Sheep

► ALASKA'S white mountain sheep, badly depleted by over-hunting, are given the benefit of a year-round closed season in the newly-announced 1949-50 game regulations for the territory. In a further effort to bring about a comeback of this beautiful and unique big-game animal, the U. S. Fish and Wildlife Service recently undertook a program of wolf- and coyote-control.

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Over 7,000,000 persons in America are estimated to be afflicted with *rheumatism and arthritis*.

GENERAL SCIENCE

GI's Resented Privileges

It was not the individual officer but the Army system of special privileges given him that objections were aimed at. Surveys were made on this and other GI attitudes.

► **RESENTMENT** of the special privileges given to officers, especially those affecting the spending of leisure time, was widespread and deep in America's citizen Army of World War II.

It was greater in overseas areas away from the firing lines than it was in the United States.

Objections were not that individual officers took undue advantage of their rank. They were aimed at the Army—for approving and encouraging a system of special privilege.

The GI attitude is revealed by the publication of surveys made during the war by the Research Branch of the Army. **THE AMERICAN SOLDIER**, published in two big volumes by the Princeton University Press, was prepared by a team of scientists in the Research Branch: Drs. Samuel A. Stouffer, Edward A. Suchman, Leland G. DeVinney, Shirley A. Star and Robin M. Williams, Jr.

Both adjustment and training of the civilian soldiers was handicapped by the fact that the educational level of the new soldier was so much higher than that of the old regulars. Among selectees, nearly half (48%) had graduated from high school and a third of this 48% had gone to college. Among the regulars, only 23% had graduated from high school, of whom very few had gone any further.

Yet it was the regulars who had the seniority and were made non-commissioned officers. It was under their direction that the new citizen soldiers were supposed to get their training.

In actual combat, the GI was not so concerned about the privileges of his officers. He had other things to worry him. One of the deepest anxieties was due to the ever present threat to life and limb.

Less well appreciated by those who were not there, the report points out, is the degree of stress imposed by sheer physical discomfort.

"Many a soldier will remember the mud and the K-rations after the memory of danger has grown dim," it is observed. In a "quiet period" in combat 22% of infantrymen reported that they could not get food. Thirty percent didn't like the kind of food they had. An additional 10% just did not feel like eating.

In the same "quiet period" 31% reported getting less than four hours sleep in 24.

But hanging over all the feeling of physical discomfort—the lying cramped in a filthy foxhole, the hunger, the heat or the

cold, the irritation of swarms of insects, and the uncertainty about what was going on and what the future held—a fundamental source of strain was the impersonality of combat. Over all else hung the thought that "we are expendable." The GI, like all other Americans, resented being "treated as numbers." This was increased by the feeling, reported by 62% of infantrymen, that there was no end to the situation until they "broke" or were hit. This feeling was encouraged by the system of replacing personnel losses by individuals rather than by units. Rotation was introduced in an attempt to provide a partial solution to this problem, but the number of men rotated was relatively small.

Why did the American soldier go on fighting in the face of all these difficulties? This question is answered also by the GI himself. It was not to make a better

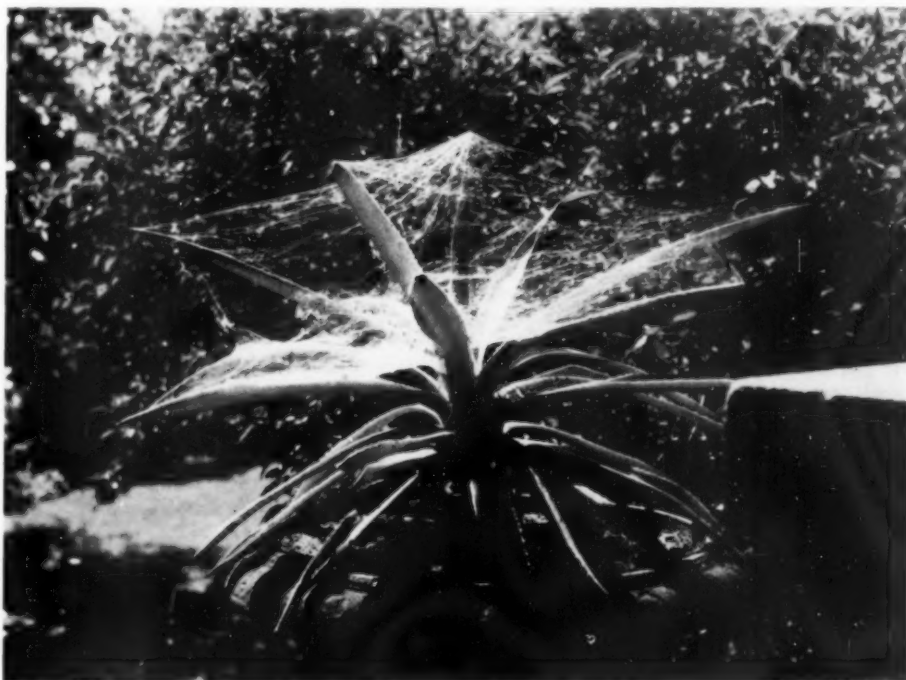
world; only five men out of a hundred gave idealistic reasons. Neither was it hatred of the enemy; only 2% were motivated by vindictiveness.

By far the largest proportion of soldiers were kept going in combat by the desire to get the war over and put an end to the job. Next in importance, named by 14%, was an unwillingness to let his buddies down. Ten percent were sustained by thoughts of home and loved ones, and 9% by a sense of duty and self-respect.

Fear in combat is universal. And in a survey of 277 wounded combat veterans in the European Theater of Operations, 65% reported that at least on one occasion their fear had been so intense that they were unable to perform adequately. The soldier is tolerant of those who "crack up" in the fear of combat; he thinks the man who cracks up should not be punished but be given medical treatment. But practically half (49%) reported that the sight of a man's nerves cracking up made them jittery, or made them feel like cracking up themselves.

Remedy, or preventive of combat fear, as seen by the men themselves, is more realistic training with live ammunition, and more training on enemy weapons and what they can do.

Science News Letter, May 28, 1949



ARACHNE AS ENGINEER—One spider, ambitious and tireless, covered the whole top of a century-plant with her web, in the yard of Harry D. Tiemann of Madison, Wis. He calls attention to the beautiful examples of suspension-cable engineering linking leaf and leaf, and especially the central spike of still-undeveloped leaves with the tips of the others. Anyone seeing this should be ready to credit the mythical Arachne, who according to Greek legend was ancestress of all spiders, not only with high skill as a weaver but with great ingenuity as an engineer.

MEDICINE

Aureomycin May Be Remedy Against Whooping Cough

► YOU'LL give a hurrah but not a whoop about this: Aureomycin, golden-yellow antibiotic drug, is apparently going to take the whoops out of whooping cough. U. S. Public Health Service scientists announce that it has given "beneficial results" in 20 patients.

Some who got it early in the disease recovered completely in a few days. In practically all cases, the severe coughing spells promptly though gradually became less frequent and less severe.

Scientists working on the project were Drs. Joseph A. Bell, Margaret Pittman and Byron J. Olson.

Science News Letter, May 28, 1949

BACTERIOLOGY

Protection Needed for Protein Fiber Fabrics

► YOUR milk coat, peanut suit and corn dress, not to mention the window draperies and furniture coverings which may be made of such materials in the future, will need storage protection against warmth and dampness. Otherwise they may be damaged by molds and other microorganisms that flourish in the soil in humid places, much as cotton is damaged by mildew.

Experiments showing this possibility of damage to the fabrics of the future that have protein fibers in them were reported by Dr. Margaret T. Goldsmith, U. S. Department of Agriculture, to the meeting in Cincinnati of the Society of American Bacteriologists.

Manufacturers are now trying to make textile fabrics from many different plants and animals. Some of these synthetic fibers are commercially used in combination with wool, rayon, cotton, nylon, mohair and fur. Paint brushes are being made from the casein in milk.

Science News Letter, May 28, 1949

GENERAL SCIENCE

Department of Agriculture Honors Five Scientists

► FIVE veteran research scientists of the U. S. Department of Agriculture were honored by their colleagues when they were presented with the Distinguished Service Awards of the Department. Each year a group is given this recognition as a kind of birthday party for the Department itself; the Congressional act organizing the Department of Agriculture was approved May 15, 1862.

Recipients of this year's awards were:

Dr. Elmer W. Brandes, who has literally made life in America sweeter through

his research programs for the improvement of sugarcane and sugar beets, and for his work on the cause and control of sugarcane mosaic. He has also done research on rubber.

Dr. Charles A. Cary, whose investigations of milk led to the discovery of a factor of great importance in the nutrition of mammals. He subsequently identified this food factor as vitamin B₁₂.

Edgar S. McFadden, who has done much towards keeping America's wheat-bins heaping full, through his development of Hope wheat. This was the original rust-resistant variety, and has been the parent of other rust-resistant wheats.

Leslie J. Sullivan, a Forest Service worker, "for heroism beyond the call of duty which resulted in saving the life of a co-worker."

Claude R. Wickard, formerly Secretary of Agriculture, now head of the Rural Electrification Administration. Mr. Wickard's selection was based on his long record as an agricultural administrator and his leadership in advances in agricultural activities.

Science News Letter, May 28, 1949

NUCLEAR PHYSICS

Uranium Belongs to Family of Seven Members

► THE atomic bomb element uranium is a family with probably seven members. And like a large human family, it can get pretty complicated.

The uranums are known by their weights—the atomic weights of chemistry which are based on giving the oxygen atom a weight of 16.

Uranium 235 is the atomic bomb variety or isotope. It is found in natural uranium in small amounts—about 11 pounds in a ton of the concentrated metal. This is the stuff that is reported missing from the Argonne National Laboratory. Because uranium is about the heaviest stuff known, the missing amount—some seven grams—would be about the size of a pea, if it's all in one chunk. (Uranium is nearly 19 times heavier than water; lead is only 11 times heavier.)

U-238 is the common metal which makes up most of the natural uranium found on the earth. The uranium being peddled in Germany is natural uranium. Like all forms of the element it is radioactive, but it is not fissionable—will not release atomic energy.

Other members of the family are: U-233, possible bomb stuff made from another element, thorium; U-234, made in the laboratory and not reported capable of releasing atomic energy; U-237 and U-239 also are man-made and not believed to be fissionable. Seventh member of the family may be U-236. This isotope has not been reported, but chemists suspect it can exist, probably for a very short time.

Science News Letter, May 28, 1949

IN SCIENCE

MEDICINE

Radioactive Phosphorus Reveals Deep Brain Tumors

► PROBING the brain with a miniature Geiger-Muller counter will help surgeons locate more accurately the deeply buried tumors that threaten life, Drs. B. Selverstone, A. K. Solomon, and W. H. Sweet of the Massachusetts General Hospital and the Harvard Medical School, report to the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (May 21).

The Geiger counter is the same instrument in miniature used to detect radioactivity in atomic laboratories.

Patients suspected of having brain tumors are given injections of radioactive phosphorus from approximately two hours to three days before operation. Tumor tissue concentrates the radioactive phosphorus. When probed by the Geiger counter, the tumor reveals its location by the accelerated ticking of the instrument.

In 14 patients brain tumors have been precisely located by this method, the Boston doctors report.

Science News Letter, May 28, 1949

NUCLEAR PHYSICS

Smuggling A-Bomb Called Possible But Not Probable

► AN ENEMY nation could smuggle atomic bombs into the United States, a military scientist declared, but he doesn't think any will.

Dr. R. E. Lapp, of the Office of Naval Research, explained that smuggling a bomb into the U. S. would involve "terrific risks, any one of which might be so great that military men would veto clandestine delivery."

Voicing his own views, Dr. Lapp said that "if (atomic) bombs are delivered to this country, they will probably come by air." His reason: "A bomb burst high in the air is the most effective way to cause maximum damage."

Best American a-bomb targets, he said, are our big cities. "Today some cities are hardly adapted to the automobile, much less the atomic bomb," Dr. Lapp pointed out.

His solution, pointed up in a recent book, *MUST WE HIDE* (Addison-Wesley), is dispersion of American cities. Not only would this make us a less attractive atom bomb target, but it would also make our cities "better places to live in, less crowded and better equipped with transportation facilities," Dr. Lapp concluded.

Science News Letter, May 28, 1949

THE FIELDS

MEDICINE

New Radioactive Isotope Promising for Bone Cancer

➤ A NEW radioactive isotope, gallium-72, may prove an unexpected ally in the fight against cancer. Animal experiments have shown that it concentrates in bone tissue and may heal tumors by its beneficial rays, the American Chemical Society meeting in College Park, Md., was told.

Approval for treating a few select patients with bone cancer at the U. S. Naval Hospital in Bethesda, Md., with the new isotope has been granted by the Atomic Energy Commission, Comdr. Horace C. Dudley of the Naval Medical Science Corps revealed.

Gallium is a rare silvery metal related to aluminum. The metal is made radioactive by bombarding it with neutrons in the uranium pile at Oak Ridge, Tenn.

Comdr. Dudley predicted that the radio-gallium may open a new path to the study of bone tumors and other bone diseases. He added a word of caution against displaying too much enthusiasm for the isotope as a tool for cancer control because its effectiveness still remains to be proved outside of the laboratory.

"Sufficient information is not yet available," he pointed out, "to allow anyone to predict the ultimate therapeutic applications, if any, of this new radioactive tool."

Science News Letter, May 28, 1949

PUBLIC HEALTH

Little Danger to Firemen in Industry's Use of Atom

➤ THE NATION'S fire fighters have little cause for alarm in the increasing use of atomic energy in American industry, the National Fire Protection Association was told in San Francisco by Edward J. Kehoe of the New York Operations Office, U. S. Atomic Energy Commission.

"We humans have a natural tendency to fear the unknown," he said, "and some of us may fear radioactivity because it cannot be seen."

Radioactivity can be dangerous, he indicated, but protective measures in use greatly decrease the hazard. During the entire period of operation of both the Manhattan project and the Atomic Energy Commission, he said, there have been only two deaths due to radiation.

"Considering the fire fighting aspects of radiation, there should be no great reason for alarm on the part of local fire department personnel who may be called on to assist us," he declared. "In the first place,

our scattered New York plants and laboratories do not generally involve 'hot' radioactive sources. In some locations where we might have fires, radioactivity would not be a factor at all. In other locations, where it could enter into the picture, we are equipped to monitor the area with survey meters to indicate intensity of radiation while the fire is in progress and to equip all or some firemen with film badges.

"The important thing to remember," he continued, "is that our tolerances have been set very low since they are based on a life time exposure where a worker may be exposed day after day for many years. Individuals such as local firemen who receive a single exposure can take many times the daily tolerance limit without ill effects."

Science News Letter, May 28, 1949

MEDICINE

Older Mice Are Tougher To Infect With 'Flu

➤ THE older the tougher seems to be the case with mice infected with influenza virus. It takes a smaller dose of the 'flu virus to kill three-week-old mice than six-week-old mice. These in turn are killed by less than it takes to kill 12-week-old mice, Dr. Seymour S. Kalter of the University College of Medicine at Syracuse, N. Y., reported to the meeting of the Society of American Bacteriologists in Cincinnati.

The difference in the killing dose for mice at different ages depends on several factors, he states. These are:

1. The immune mechanism which prevents the spread of the virus from parasitized cells to normal ones;

2. The amount of available lung tissue that may be put out of action without harming lung functioning; and

3. "Intrinsic factors of as yet undetermined nature," which Dr. Kalter says may have to do with the animal's ability to manufacture protein.

Science News Letter, May 28, 1949

NUCLEAR PHYSICS

New Baby Atom Smasher Developed in Holland

➤ A BABY atom-smasher with a 9,000,000-electron-volt punch has been built at the famous Philips Research Laboratories in Holland. It is so light and easy to handle that it will be taken to the job instead of moving the job to it.

This new type of betatron, a device for speeding up electrons to high energies, is the invention of Dr. A. Bierman. It has no heavy and expensive iron yoke with which such machines are usually constructed. It was reported in NATURE (April 23).

Science News Letter, May 28, 1949

BIOCHEMISTRY

Female Mammal Hormone Found in Roosters' Blood

➤ JUST what would roosters be doing with a body chemical, the principal known function of which is to help female mammals bring their young to live birth?

This is the physiological riddle that confronts Dr. Richard M. Fraps of the U. S. Department of Agriculture, Dr. Charles W. Hooker of Emory University and Dr. Thomas R. Forbes of Yale University.

Some months ago the three investigators found in the blood of hens the hormone known as progesterone, which had until that time been known only in mammals, where it brings about the attachment of the early embryo to the maternal tissues that will nourish it until it is born. This seemed odd enough; but at least the hens were female animals, and thus might be considered physiological "sisters under their skins" to female mammals.

Now, however, the scientists have found progesterone in the blood of roosters—which aren't even females. What it's doing there—if anything—they haven't any idea. That is what they are going to try to find out next.

Details of their new findings are given in the journal, SCIENCE (May 13).

Science News Letter, May 28, 1949

VETERINARY MEDICINE

Cabbage-Worms Poison Young Ducks Eating Them

➤ AN effective but expensive way to get rid of cabbage-worms: let young ducks eat them. It eliminates the cabbage-worms all right—but it also eliminates the ducks.

Several cases of poisoning in ducks that had been allowed to eat their fill of the "squidgy" caterpillars of the common white cabbage butterfly are reported by Drs. J. E. Wilson and R. H. Duff of the veterinary laboratory of the British Ministry of Agriculture and Fisheries.

Dead ducklings were sent to the two veterinarians by their puzzled owners, who wanted to know what was killing their young birds. In each case it was found that they had been given the run of a cabbage-patch infested with the caterpillars.

Experimental feedings were undertaken, and it was found that if a month-old duckling ate 40 to 50 cabbage-worms it would sicken and very probably die. The poor birds would stop eating, stand motionless with ruffled plumage, and finally pass into a coma from which they did not recover.

The poisonous principle in the caterpillars has not yet been isolated. Drs. Wilson and Duff are waiting now for a new caterpillar season so that they may continue their investigations.

Science News Letter, May 28, 1949

ASTRONOMY

Summer Begins on June 21

The planets Saturn and Venus will be visible in the evening sky. Antares, bright star in the constellation Scorpius, will be eclipsed by the moon.

By JAMES STOKLEY

► PERHAPS the most welcome astronomical event of June is the one that will occur on the 21st, at 1:03 p.m., eastern standard time (2:03 p.m., eastern daylight saving time). At that moment the sun, which has been moving northwards in the sky ever since last December, now reaches its turning point, and stands on the Tropic of Cancer. This is the summer solstice for it marks the beginning of summer in the northern hemisphere. At this time it turns and starts its southward journey. Incidentally, it is from this that the word, "tropic," gets its name, for it is derived from a Greek word (tropos) which means a turning. In December, just before Christmas, when winter begins in northern countries, the sun is on the other tropic, the Tropic of Capricorn. Underneath these lines in the sky are the corresponding circles on the earth. Between them are the "tropical" regions.

Longest Day

Because the sun is now so far north, it rises highest for us at noon and is above the horizon for the longest time, so June 21 will be our longest day. At 40 degrees north latitude, for example, there are 15 hours 1 minute between sunrise and sunset, while at 50 degrees north latitude the length of the day is 16 hours 22 minutes on the 21st. In contrast, at the winter solstice next Dec. 22, the day will be 9 hours 19 minutes long at 40 degrees and 8 hours 5 minutes at 50 degrees.

In the southern hemisphere, however, conditions are reversed, for there the noon-day sun is lowest in the sky and the days are shortest. In other words, this is for them the beginning of winter.

In the evening skies, too, is reflected the coming of summer, for now we can see such constellations typical of warm weather as Scorpius, the scorpion, and even part of the southerly group of Centaurus, the centaur. To see all of this mythical creature, however, we must travel farther south than the United States.

Both these constellations are indicated on the accompanying maps. These show the heavens as they appear about 10:00 p.m. standard time (or 11:00 p.m., daylight time) of the zone that you are in, at the beginning of June and an hour earlier in the middle of the month.

In Scorpius is the bright star Antares, markedly red in color. On the evening of

June 9, the moon, a day short of the full phase, will pass close by it. For people in the eastern half of the United States and Canada, the star will actually be occulted, or "eclipsed," by the moon.

As seen from Washington, Antares will go behind the moon at 9:38 p.m., EST (10:38 EDST) and will reappear at 10:36 (11:36). For a position in western Massachusetts, the disappearance occurs at 9:40 EST (10:40 EDST) and the reappearance at 10:48 (11:48). In Montreal the corresponding times will be 9:34 (10:34) and 10:35 (11:35). Farther west, the duration of the occultation is less. At a particular station in western Illinois, for which times of such phenomena are calculated by the Nautical Almanac Office of the U. S. Naval Observatory, the star will be hidden at 8:43 CST and will come into view again at 8:55. Where visible, this occultation can easily be observed with the naked eye, but a pair of binoculars, or even opera glasses, will help. Even in more westerly locations, where the moon misses Antares, it will be of interest to watch their very close approach.

As for the other constellations of a June evening, we have Libra, the scales, in the south to the right of Scorpius, and to the right of that is Virgo, the virgin, with the first magnitude star Spica. Continuing to the right, we see Leo, the lion, of which Regulus is the brightest star, and close to it stands the planet Saturn. High overhead we find Arcturus in Bootes, the bear-driver. Toward the east there is Vega, in Lyra, the lyre, and below this Cygnus, the swan, otherwise known as the "northern cross," with Deneb. To the right of this group one sees Aquila, the eagle of which the star Altair is of the first magnitude, though

it is so low that its brilliance is somewhat dimmed.

This is even more true for the stars shown low in the northwest. Pollux, in Gemini, the twins, and Capella, in Auriga, the charioteer, are both of the first magnitude, as we recall from seeing them shining brilliantly overhead in the winter evenings. Now they are so low that their light has to pass through a great absorbing thickness of our atmosphere.

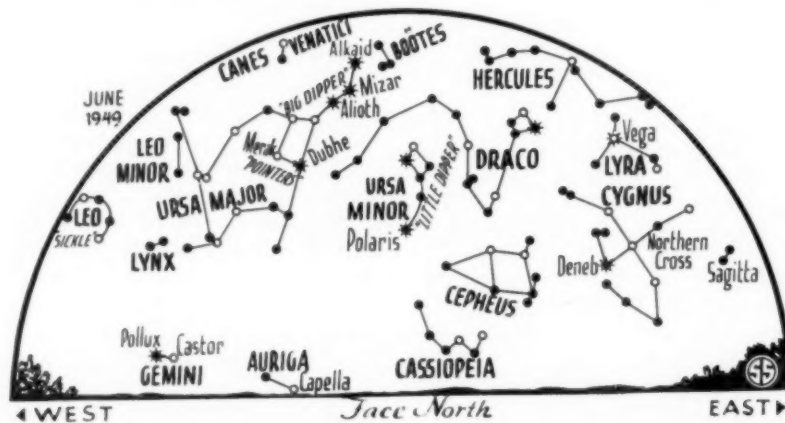
In addition to Saturn, Venus is another planet now in the evening sky. It is in the constellation of Gemini, very low in the west at sunset, so you have to look carefully to find it. It is so bright, however, that it can be located in the gathering dusk. Jupiter comes up around midnight, in the constellation of Capricornus, the sea-goat. It will be seen then low in the southeast, shining more brilliantly than any other star or planet.

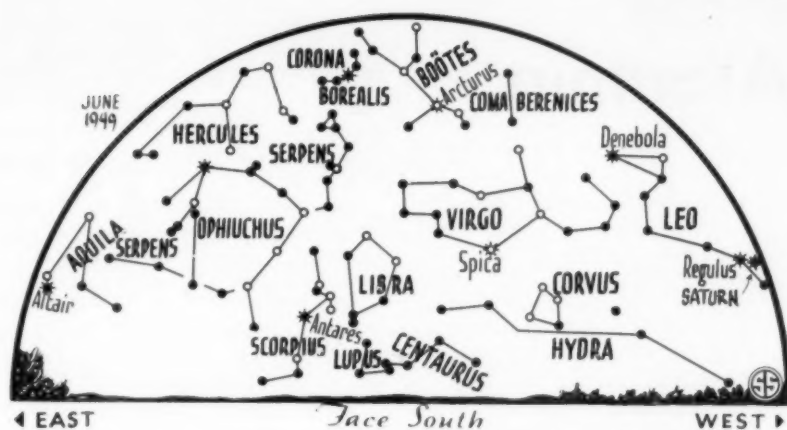
Sun's Warmth

Something that often puzzles people is why the sun should be so much warmer in June and the succeeding months, and why we do not have the warmest weather when the sun is sending the most heat to our part of the earth. First of all, it is not because of the sun's proximity, for in fact the sun is several million miles farther away in our summer than it is in winter.

Part of the cause is found in the longer days. With the sun so far north, it rises far to the north of the east point and sets far north of the west point of the horizon. Ascending so high at noon, it has the longest path of the year across the sky, which takes the greatest time. And with the sun above the horizon so long, it has more opportunity to heat the ground.

Also, when the sun is high, its rays of light, and of heat, are more concentrated. If the sun were directly overhead, a yard-square beam of radiation would cover just a square yard of the earth's surface. In the





• • • SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS

winter, on the other hand, when the sun is low and its rays strike the ground at a very low angle, the yard-square beam might be spread over as much as two square yards of ground. Hence the heating effect would be only half as much.

But this does not explain why on June 21, when these two factors are at their maximum, we do not have the hottest weather. The reason is that each night the earth loses a lot of the excess heat it gained during the previous daylight hours. During June, and even much of July, the short nights do not permit it to get rid of as much as it gained, and it continues to get warmer. Finally, by the end of July, it starts to suffer a net loss of heat, and then begins to get cooler. A similar effect, in reverse, is responsible for the fact that Dec. 22, when the sun gives the northern hemisphere the least heat, is not the coldest of the year.

ASTRONOMY

British Get Giant 'Scope

► THE GIANT, 98-inch glass mirror for the largest telescope in the world outside of the United States has been presented to Britain's Royal Greenwich Observatory by the McGregor Fund of the University of Michigan.

Gift of the 98-inch pyrex glass disk and a secondary mirror and plug for the planned Isaac Newton telescope at the Royal Observatory was disclosed when the lords commissioners of the British Admiralty sent their thanks to Judge Henry S. Hulbert of Detroit, president of the McGregor Fund board of trustees.

Only larger telescopes in the world are the 200-inch giant eye of Mount Palomar and the 100-inch 'scope on Mount Wilson, both in California. A third larger telescope of 120-inch diameter is being planned for the Lick Observatory, also in California. Biggest 'scope outside of the U. S. at present is a 74-inch one at Radcliffe Observatory, Pretoria, South Africa.

The big glass for the Royal Observatory is a little brother of the Palomar mirror. It was made at the Corning Glass Works in Corning, N. Y., after the 200-inch eye for Palomar was poured. The 98-inch mirror was originally planned for a University of Michigan telescope which was not built because the depression reduced available funds.

Arrangements for the gift were completed at Ann Arbor, Mich., late in March during the visit there of the Astronomer Royal, Sir Harold Spencer Jones.

The Isaac Newton telescope which will use the mirror will be located at Hurstmonceux, England, where the Royal Greenwich Observatory is in the process of moving from its traditional home in Greenwich.

Value of the 98-inch mirror, a secondary, 26.5-inch disk and the plug for the center hole of the large glass is hard to estimate. Original cost was only some \$15,000, thanks

to the fact that they were made at the time Palomar's mirror was poured. They would probably cost about \$80,000 to make now.

The late Dr. Heber D. Curtis of the University of Michigan, directed planning for the 'scope at the University, and funds were appropriated by the Michigan legislature. After the mirror, a gift from the McGregor Fund, had been completed, the depression came and funds were cut off.

Science News Letter, May 28, 1949

GENERAL SCIENCE

Fellowships To Train Scientists for Atom Jobs

► FELLOWSHIPS to help in training more scientists for radiology work with atomic products in industrial laboratories, U. S. Atomic Energy Commission laboratories, and hospitals are being offered to science or engineering graduates.

The Atomic Energy Commission fellowships in radiological physics are being administered by the National Research Council. They carry an annual basic stipend of \$1,500 for single fellows and \$2,500 for married students. Applications for next year must be received by June 10.

Science News Letter, May 28, 1949

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MEDICINE

Cancer Upsets Albumin

► A CHEMICAL that will keep egg white from getting hard-boiled, no matter how long you heat it, and the process that prevents the hardening, form the basis of a new cancer detection test.

How the test is made and the significance for cancer lighting of the underlying chemistry, were explained by the man who developed the test, Dr. Charles B. Huggins, University of Chicago professor of surgery. Dr. Huggins spoke as guest of Watson Davis, director of Science Service, on the Adventures in Science radio program, broadcast each Saturday over the Columbia Broadcasting System (See *SNL*, April 23, p. 259).

"The important thing," Dr. Huggins said, "is that the presence of cancer in an individual upsets the mechanism of serum albumin. The person with cancer makes a defective albumin."

Albumin is seen most frequently by the lay person in the white of the egg he eats for breakfast. But albumin, which is a protein, is also present in blood serum. Scientists think, from present evidence, that the blood serum albumin is manufactured in the liver. When cancer develops, according to the theory, it depresses the liver's synthetic activity so that it makes faulty albumin.

"The chief interest in this whole research, more important perhaps than the detection test itself, is what light the disturbed albumin casts on the general nature of the disease we call cancer," Dr. Huggins emphasized.

The cancer detection test shows that the blood serum has this faulty albumin. Here is how it works:

Thermal coagulation is one of the commonest every day operations of the kitchen: when one boils an egg, the albumin and other proteins change from a clear liquid to an opaque solid which we call hard-boiled. What happens, in essence, is that the globe-shaped molecule of egg albumin changes to a string-like, or fibrous, state. Accompanying this unfolding there is a liberation of sulphydryl, that is, sulfur-hydrogen groups which previously had been coiled in the globular protein and upon liberation of hydrogen a sulfur to sulfur bonding takes place.

That is the chemical language for hard-boiled eggs. When human serum is heated in a tube of boiling water the same process takes place: solidification, cloudiness and the formation of sulfur to sulfur bridges to form a three-dimensional lattice.

Iodoacetic acid is used in the test. This chemical compound at neutrality, provided a minimum quantity is present, has the peculiarity of preventing coagulation of egg white and also of human serum; no matter how long they are heated, neither

of these protein solutions becomes hard-boiled.

If somewhat less than the minimum quantity of iodoacetic acid is added to egg albumin or human albumin and the mixture is boiled, a very curious effect is observed. The albumin coagulates but does not become cloudy: instead a translucent glassy state occurs. The hard-boiled proteins have rubbery elastic qualities and may be stretched considerably and will recoil when tension is released. But the strangest property is their translucency: they are so glassy that one can read a newspaper through the hard-boiled proteins.

The opacity of serum or of a hard-boiled egg is due to the cross linkages of sulfur atoms and its "hardness" is due to arrangement in parallel bundles of amino acid polymers of rather long length. Iodoacetic

acid first blocks the side chain binding and in larger amount prevents the formation of long chains, hence the protein remains liquid. The serum of most cancer patients requires far less iodoacetic acid to prevent coagulation by heat than the serum of normal persons.

That is the background to Dr. Huggins' development of what is for all practical purposes a simple, cheap and reasonably sure blood test for cancer. In the experimental series, the test has been made on almost 300 persons, divided equally between cancer patients, apparently healthy persons and patients with diseases other than cancer. The test proved positive for all cancer patients, negative for all normal persons and negative for all other patients except those with lung tuberculosis and massive acute infections.

Doctors won't be able to give this test today or tomorrow. It may be months before arrangements can be made for its wider trial and still later before it becomes generally available.

Science News Letter, May 28, 1949

METEOROLOGY

Weather Reporting Pact

► NORTH ATLANTIC weather stations on vessels of six nations will remain in operation for a new three-year period, in compliance with an agreement just signed in London by member states of the International Civil Aviation Organization, after the present pact has expired.

Ten stations stretching from the Western Hemisphere to the coast of Norway will continue to make weather observations and radio reports at frequent intervals for the benefit of transoceanic air traffic, and also for vessels on the ocean. A total of 25 ships will be used for the purpose. Coordinating with their work, land-based stations in Canada, Greenland and Iceland will continue.

The United States, as the nation most interested, will provide 14 vessels for the purpose. The United Kingdom will provide four, and France, the Netherlands and Norway, two each. Canada will provide one. Belgium and Denmark will make financial contributions annually to Norway toward the cost of operation of one station off the Norwegian coast. Ireland and Portugal will make small annual contributions toward the scheme in general.

The ten stations of the network will continue to supply weather data, communications and rescue services now being provided North Atlantic air traffic under a London, 1946, agreement. This expires June 30, 1950, and the new agreement will then go into effect. This re-locates the stations for increased efficiency and economy in operation.

At another ICAO committee meeting, a plan was adopted for international financ-

ing of weather stations in Greenland and a loran station in the Faroe islands. Both are Danish possessions. The Faroe group is centrally located in the ocean about an equal distance from Iceland, Scotland and Norway. Loran is the war-developed navigation system which provides radio beams by means of which a plane or ship is able to determine its geographical position. Denmark will operate these stations, but other nations will contribute to the cost about in proportion to their share in North Atlantic air traffic.

Science News Letter, May 28, 1949

Words in Science— METEOR—METEORITE

► A METEORITE is a solid body of mineral or metallic composition which arrives on the earth's surface from outer space. Meteorites range in size from a few milligrams to many tons. If one is seen to fall and is later picked up, the meteorite is called a "fall." If the meteorite is not seen to fall, but instead is found in the countryside, it is called a "find."

A meteor is seen only as a fiery or luminous body flashing across the sky, especially in the fall of the year. While in the sky it is a meteor; when it falls to earth it is a meteorite. Meteors, because they appear much larger than they really are, are wrongly called "shooting stars" or "falling stars."

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Sale...

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I AGRICULTURAL PRODUCTS COLLECTION

An oil shampoo, the chief ingredients of which were extracted from coffee beans; complete ball of fluffy white cotton; ramie stem complete with ribbons of fiber just beneath the thin bark—these are some of the exciting objects contained in the COFFEE BYPRODUCTS, COTTON and RAMIE UNITS making up this collection. In the picture you see the 16 specimens that will be yours if you select this group. The oil shampoo, powdered soap, all-purpose cleanser and hair rinse were all made from roasted coffee beans (center). Cotton tinted brown and green by nature, as well as white cotton fibers, a complete cotton ball, cottonseed meal and cottonseed hulls (right) are also included. Ramie stem, ribbons of the fiber, degummed fiber, fiber ready for spinning and completed fabric (left) demonstrate the story of this unique fiber.

II TASTE COLLECTION

Sugar 500 times as sweet as sucrose; pieces of tan-colored bark used to season food; an edible wetting agent often used in chocolate, nut brittle and toffee—these and many other intriguing specimens are contained in the SWEETNESS, SPICE and SOYBEAN LECITHIN UNITS which make this tasty collection. There are 18 specimens in all, including saccharin, dextrose, lactose, allspice, cinnamon, cloves, ginger, sage, mustard, soybeans, pure lecithin and lecithinated flour.

III HOME COLLECTION

Paints that glow in the dark; plastic spoon for measuring coffee; reinforced plastic film for shelf and table covering—these are the interesting objects in the PHOSPHORESCENCE, HOME AND OFFICE, and HOUSING MATERIALS UNITS contained in this collection. The 16 specimens to be found in these three boxes include phosphorescent tape and paint, coffee measure, plastic-and-wire screening, shaver head, wood fiber insulation board, plywood, glass fiber fabric and glass insulation.

IV PLANT COLLECTION

Latex from the sapodilla tree, basic material for chewing gum; crystals that kill insects; brilliant dyes obtained from plant roots—these are the interesting specimens in the CHICLE, INSECTICIDE and VEGETABLE DYE UNITS that will be sent if you order this collection. Included in the 18 specimens making up these three kits are raw chicle, unfinished gum centers, candy-coated gum, DDT crystals, powdered DDT, wettable DDT, pyrethrum flowers and rotenone dust.

V CHEMICAL COLLECTION

Powder from which you can make a length of synthetic fiber; a yellow non-metallic element used for matches, fertilizer and insecticides; zinc made fine-grained by incorporation of only 0.05% lithium—these are contained in the VINYL RESIN FIBER, SULFUR and LITHIUM UNITS comprising this collection. The 20 specimens include vinyl resin, filter cloth, felt, tea bags, sulfur-bearing limestone, pyrites, zinc sulfide, flowers of sulfur, natural spodumene lithium chloride, lithium nitride, pure zinc and lithium treated zinc.

VI TEXTILE COLLECTION

Material made from cat-tails; twisted cord used in auto tires; soft fibers made from glass—these are the surprising subjects in the UNUSUAL FABRICS, RAYON and GLASS FIBER UNITS. Sixteen specimens are contained in the three packages, and include fabric pressed from spruce-pulp cellulose, "fur" made from the Typha plant, fabric made from milk protein, cotton pulp, chemical cotton in sheet form, rayon fabric lining material, large glass fibers that break easily, and fine ones about .00022 inch in diameter.

VII MINERAL COLLECTION

Stone that attracts bits of iron; remains of trees that lived millions of years ago; bits of semi-precious stone used in sand blasting and abrasives—these are the intriguing specimens in the LODSTONE, PETRIFIED WOOD and SAND UNITS to be sent those selecting this collection. Among the 17 specimens in this set are lodestone, iron filings, compass card, petrified oak, elm, redwood, sweetgum and bog, round sand, greensand, heavy sand, calcareous sand and garnet sand.

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ETHNOLOGY-BOTANY

NATURE RAMBLINGS

by Frank Thone



Memorial Days

► FLOWERS have been grave-decorations through all known history—and probably back into the dawn of civilization that preceded history. The ancient Egyptians, who held their dead so dear that they gave an ancestral mummy the place of honor at some of their feasts, wore garlands themselves and decked the sarcophagus with flowers.

We do no strange or new thing, then, when we make a little pilgrimage of piety,



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once in the year at least, to place wreaths or bouquets on the graves of our dead, or to plant living flowers there to keep verdant vigil during the many days when we are away. Observing a day of floral remembrance only marks us as normal members of the human brotherhood.

The particular day of observance, May 30, now general over most of the United States, had its origin in 1869, not long after the Civil War. At the outset, it was primarily followed in the North; various states of the Confederacy had their own Memorial Days—May 10 in the two Carolinas; June 3 in most of the other states of the South. Although in its inception a day of recollection for dead heroes only, Memorial Day soon came to be a day for remembering all one's departed relatives and for decorating all their graves.

There is said to be some tendency now

MEDICINE

Researchers Request Dogs

► UNCLAIMED dogs in the public pound in Washington will be used in medical research instead of being killed in the gas chamber, if bills now pending in Congress are enacted. Hearings on this legislation (H. R. 4238 and S. 1703) were scheduled to begin Tuesday, May 24.

Supporters of the bills point out that Washington has become one of the greatest medical research centers in the world. In addition to the various government research institutions, there are the medical schools of Georgetown, George Washington and Howard Universities. Investigations in veterinary medicine are also conducted by scientists of the U. S. Department of Agriculture.

All this research requires the use of animals, among them dogs. At present, dogs have to be purchased; and their scarcity and consequent high prices are indicated as handicaps to research.

Research workers point out further that while they are having a hard time getting enough dogs for experimental purposes, the D. C. pound annually destroys five or six thousand unclaimed animals. Since they must die anyway, it is argued, their deaths might as well serve some useful purpose, besides saving a little of the taxpayers' money.

Death in the dog-pound's gas chamber is essentially like human suicidal or accidental death in a gas-filled kitchen; it is caused primarily by carbon monoxide poisoning. It is fairly quick though not entirely painless, but may be said to involve a minimum of suffering.

Dogs and other animals that die in the laboratory pass out under the same anesthetics as are used in human surgery, so that when they do die on the operating table they are completely unconscious and incapable of feeling any pain at all. When

in the South to accept May 30 as a day of remembrance also. If this should come to pass it would be only natural; many young men have fought and died under the Stars and Stripes whose grandsires fought for the Stars and Bars—and in the latest of our wars South Carolinians and even Texans accepted the nickname "Yanks" with good grace, when bestowed by allies whose intimate knowledge of American history was not on a par with their good will.

Celebration of Memorial Day, or Decoration Day as it soon came to be widely known, at this time of year has its practical as well as its sentimental reasons. Spring is well advanced and the supply of garden flowers is at its height. Yet it is not too late to set out most kinds of shrubs and perennial herbs, or to plant seeds of annual flowers on and around the graves of those whom we would remember.

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the experiment calls for the survival rather than the immediate death of the animal, post-operational care is at least as good as that in a well-run veterinary hospital.

By no means all of the experiments involving the use of animals are surgical. Tests of many drugs, vitamins, hormones, vaccines, serums and so on are carried out on dogs and other animals before the first use on a human volunteer is ventured. For all these medical pioneerings many dogs are needed. Supporters of the bills now before Congress hope to make use of animals now wasted even in their death.

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AERONAUTICS

Install Moving Stairways In Navy Carrier Vessels

► JET PILOTS on Navy carrier vessels will soon be able to reach the flight deck from below in the best of "take-off" condition, in spite of their 40-pound equipment pack, with the installation of rapid moving stairways. Westinghouse Elevator Division, in Jersey City, N. J., revealed that it is building the installations for at least three of the Naval floating aircraft bases.

Some 28 feet of ordinary stairs takes the wind out of the ordinary pilot when he has to answer an emergency call for an immediate take-off, particularly with the weight of equipment that he must carry. The new moving stairways will be capable of carrying 30 pilots a minute from the hangar deck to the flight deck. They will be much like the familiar escalators in department stores, but will be especially constructed and will utilize materials able to withstand the peculiar conditions encountered on shipboard.

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Books of the Week

TO SERVE YOU: To get books, send us a check or money order to cover retail price. Address Book Dept., SCIENCE NEWS LETTER, 1719 N. St., N. W. Washington 6, D. C. Ask for free publications direct from issuing organizations.

BRITANNICA BOOK OF THE YEAR 1949—Walter Yust, Ed.—*Encyclopaedia Britannica*, 810 p., illus., \$10.00. A source of information and statistics on 1948's happenings.

ELMTOWN'S YOUTH—A. B. Hollingshead—Wiley, 480 p., illus., \$5.00. How 735 adolescents act in a typical American town on dates, in church, in school, in their jobs, and leisure time. A study under the auspices of the Committee on Human Development of the University of Chicago, reported for laymen.

ENCYCLOPEDIA OF CRIMINOLOGY—Vernon C. Branham and Samuel B. Kutash, Eds.—*Philosophical Library*, 527 p., \$12.00. A reference book alphabetically arranged.

FLEXURAL FATIGUE STRENGTH OF STEEL BEAMS—Wilbur M. Wilson—*University of Illinois*, 34 p., illus., paper, 20 cents. A report of an investigation conducted by the Engineering experiment station.

FLOWERS THAT BLOOM IN THE SPRING—Virginia S. Eifert—*Illinois State Museum*, 48 p., illus., paper, 15 cents. Information and attractive drawings to aid in identifying the flowers of the Illinois spring woodland.

GUIDING FAMILY SPENDING—U. S. Department of Agriculture—*Gov't Printing Office*, 26 p., illus., paper, 15 cents. The answers to questions that come pouring in daily to the Bureau of Human Nutrition and Home Economics. A guide to families and workers helping families.

A HANDBOOK OF SLAVIC STUDIES—Leonid I. Strakhovsky, Ed.—*Harvard University Press*, 753 p., \$12.50. A guide to the geography, ethnology, history, and literature of every Slavic country.

INDUSTRIAL USES OF RADIOACTIVE MATERIALS—Arthur D. Little, Inc., 13 p., paper, free upon request to publisher, Cambridge 42, Mass. A selected bibliography.

INTRODUCTION TO STATISTICAL MECHANICS—Ronald W. Gurney—*McGraw-Hill*, 268 p., illus., \$5.00. An advanced text for graduate students of physics and chemistry.

LEARNING TO DRIVE SAFELY—A. R. Lauer—*Iurgess*, 145 p., illus., \$2.25. A text-manual and guide to the science of driving instruction with suggestions for training areas and evaluation techniques for courses in high schools, colleges and teacher training institutions. The author is a psychologist who has specialized in highway safety.

LIFE ON OTHER WORLDS—H. Spencer Jones—*New American Library*, 157 p., illus., 35 cents. The author, an eminent British astronomer, summarizes the evidence and attempts an answer to this age-old question "Are we the only inhabited planet?" Reprint of a book originally published by Macmillan.

MAN-MADE PLAGUE: A Primer on Neurosis—William G. Niederland—*Renbale*, 304 p., \$3.50. A guide intended to aid the layman in understanding and preventing nervous ills.

THE MIRACLE OF TELEVISION—Luther S. H.

Gable—*Follett*, 151 p., illus., \$2.50. A description of how television works, what it does and what its future possibilities are. Written for the layman.

NEW WAYS IN DISCIPLINE: You and Your Child Today—Dorothy Walter Baruch—*Whittlesey*, 280 p., illus., \$3.00. Answering the question, "Should I spank my child?" and many others disturbing to parents.

PAPERS PRESENTED AT THE FIRST SHORT COURSE ON HOT WATER AND STEAM HEATING SYSTEMS—*University of Illinois*, 108 p., illus., paper, 50 cents. Methods of designing and installing hot water and steam heating systems for residences.

PAPERS PRESENTED AT THE SEVENTH SHORT COURSE IN COAL UTILIZATION—*University of Illinois*, 192 p., paper, \$1.00. Technical and practical information for those engaged in mining, preparing, marketing and using coal.

PEACE OR PESTILENCE—Theodor Rosebury—*Whittlesey House*, 218 p., \$2.75. An authority presents his views on biological warfare and how to avoid it.

POLIO CAN BE CONQUERED—Alton L. Blakeslee—*Public Affairs Committee*, 31 p., illus., paper, 20 cents. Latest advances in the conquest of infantile paralysis with practical tips for parents on what to do if polio breaks out in an epidemic form in their neighborhood.

SOCIAL CLASS IN AMERICA: A Manual of Procedure for the Measurement of Social Status—W. Lloyd Warner, Marchia Meeker, Kenneth Eells—*Science Research Associates*, 274 p., illus., \$4.25. The authors believe it important to understand the American status system. They present a scheme for finding your own class level or that of your neighbors.

SOVIET ARMS AND SOVIET POWER—Augustin Guillaume—*Infantry Journal Press*, 212 p., illus., \$3.50. A French general appraises Russia's military strength. Foreword by Lt. Gen. Walter Bedell Smith.

TABLES OF INVERSE HYPERBOLIC FUNCTIONS—Staff of the Computation Laboratory—*Harvard University Press*, 290 p., \$10.00. Presentation of the inverse hyperbolic sine, cosine, and tangent tabulated to nine places. For the applied mathematician.

THEMATIC APPERCEPTION TEST: Thompson Modification—Charles E. Thompson—*Harvard University Press*, Manual: 11 p., paper, 50 cents; Test: 30 plates, \$5.00. A series of pictures constructed similar to the pictures in the TAT (1943 edition) except that Negro figures are used in place of white. The material in the manual is largely adapted and abridged from the manual accompanying the original TAT.

UNITED STATES PARTICIPATION IN THE UNITED NATIONS: report by the president to the congress for the year 1948—*Gov't. Printing Office*, 303 p., paper, 55 cents. Includes report of the action on Human Rights and text of the declaration.

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Science Service Radio

► LISTEN in to a discussion on "New Research in Psychosomatic Medicine" on "Adventures in Science" over the Columbia Broadcasting System at 3:15 p. m. EDST, Saturday, June 4. Lord Horder of England, Dr. Edwin Jordan of Cleveland, O., and Dr. Edward Weiss of Philadelphia, will be guests of Watson Davis, director of Science Service. These doctors will give a report on the International Congress on Rheumatic Diseases to be held in New York May 30-June 3. Lord Horder, one of the physicians to the king, will represent the foreign contingent. Dr. Weiss will give new results which show that many cases of rheumatism have a psychogenic twist.

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VETERINARY MEDICINE

Male Dogs' Blood Pressure Higher than Females

► DOGS are like people in another way: blood pressure averages higher in males than in females. This has been demonstrated in tests carried out at the University of West Virginia medical school, Morgantown, W. Va., by Drs. E. J. Van Lier, J. C. Stickney and D. F. Marsh.

Earlier studies, especially at the University of Minnesota, had established the fact that blood pressure in men averages higher than it does in women, by about 11 millimeters of mercury. In dogs the difference is slightly less, pressure in males being higher by about nine millimeters.

The three West Virginia scientists present their results in the journal, SCIENCE (May 13).

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DAGOBERT D. RUNES, Editor

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☼ **FIRE EXTINGUISHER**, designed especially for use in homes, is a slim steel cylinder containing carbon dioxide under pressure. When a nozzle on one end is turned by the hand, a cloud of dry-ice snow is discharged. The cylinder can be recharged.

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☼ **VENETIAN BLIND** cleaner is a frame or easel on which the blind is stretched with two hooks at the top from which it hangs. Blind slats can be reversed without removal from the frame, and the solid slats of the frame provide a back to press against.

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☼ **DRAPERY FIXTURE** for living room windows has extensions to widen the space covered by the drapes to make the window look larger, and is adjustable to hold the drape up to nearly six inches away from the wall, a boon for windows with Venetian blinds and radiators.

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☼ **COFFEE ROASTER**, with infra-red heating units, is automatic in operation and requires less than a minute to convert green coffee into roasted beans ready for the grinder. A push of a button drops a pound of the coffee into the baking chamber and out when roasted, the process being



visible to a customer as shown in the picture.

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☼ **ELECTRIC FURNACE**, an improved type for use in sintering powdered metals, brazing and light annealing, is a manual pusher type, designed for batch treatment on a straight-line three-zone system. The work moves through a pre-heating chamber,

high-temperature section, and a water-cooled, cooling zone.

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☼ **CHEMICALLY TREATED** wrapping paper, in which to wrap tools, engine parts and fine instruments to keep them from rusting, is ordinary kraft paper coated on one side with a special chemical preparation. After the article is wrapped, the chemical vaporizes inside the package, neutralizing the corrosive action of moisture in the air.

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☼ **FOOD BAGS**, for use in a deep freezer, are made of a polyethylene plastic which permits them to be used over and over again. They will not stick together or crack even in sub-zero temperatures, and can be cleaned with soap and water.

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☼ **LIQUID PLASTIC** permits home treatment of a straw hat so that it is uninjured in a rainstorm. The fast-drying, transparent, waterproofing liquid comes in handy spray dispenser, and is applied after trimming is removed. It can be used to protect leather handbags as well as hats.

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Do You Know?

Freight locomotives use about a ton of coal for every seven miles.

Milk, like other agricultural products, is actually a product of the soil, the cow being the manufacturer.

In 1948, approximately 66% of the income from poultry raising in the United States was from eggs.

The fertilizer industry plays an important part in the daily life of all people; every mouthful of food consumed was dependent on some form of fertilization.

Two American helicopters have been sent to Italy for service in fighting the malaria-bearing mosquito and the dacus fly which destroys olive crops.

Radio heat is now used in industry in making rubber mattresses, automobile tires, plastic cabinets, and phonograph records, and in hardening metals.

Rheumatism is rated as America's number one chronic disease.

Norway is building air raid shelters, "Aftenposten" shelters to Norwegians, in mountain sides by blasting out rock.

California reaches 14,495 feet high at the top of Mount Whitney, and 208 feet below sea level in the Death Valley region.

The University of Pennsylvania and the University of Oslo, Norway, have united in a joint publication called "The American Spirit in Europe."

Alaskan sea lions have practically no economic value now although they sometimes provide food and clothing to Alaskan natives.

International communication by wire or radio calls for diplomatic relations; the cooperation of the nations controlling foreign terminals must be secured.

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